SDGE

Southern California Gas Company

Sempra Energy utilities

Gas Interchangeability - An LDC's Perspective

FERC Interchangeability Conference

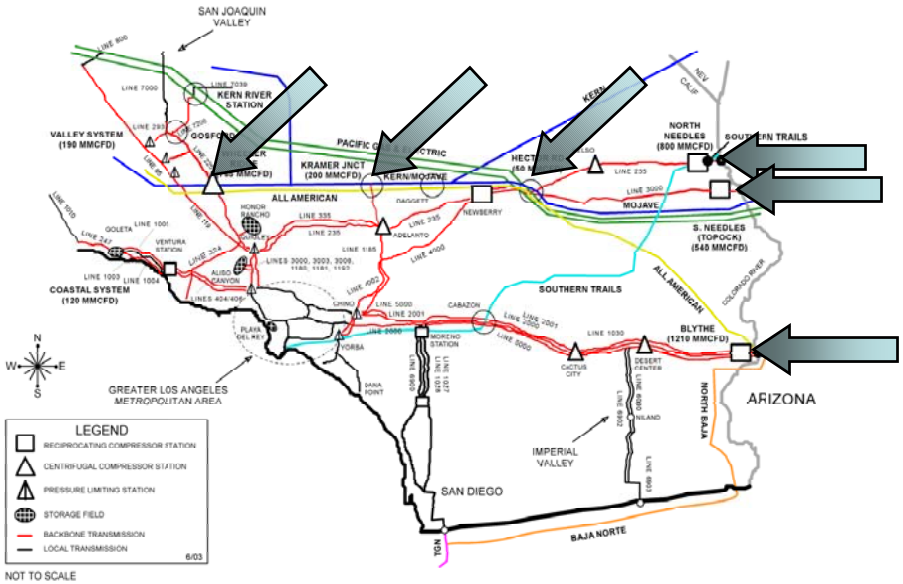
February 18, 2004

Sempra Energy Utilities

Combined Gas Operations

- Service Territory — 27,000 sq. miles
- Customers — 5.8 million
- Pipelines
  - Mains — 55,000 miles
  - Service — 44,000 miles
- Storage Capacity — 122 billion cu ft
- Annual Throughput — 900 billion cu ft

Current Gas Supplies



Gas Supply Characteristics

- Interstate Gas Supplies:
  - 88% of total supply (2.2Bcf/d)
  - 6 Receipt Points
  - Primarily Rockies & San Juan Basin
- California Gas Supplies:
  - 12% of total supply (0.3 Bcf/d)
  - 60 Delivery Points
  - Multiple small suppliers

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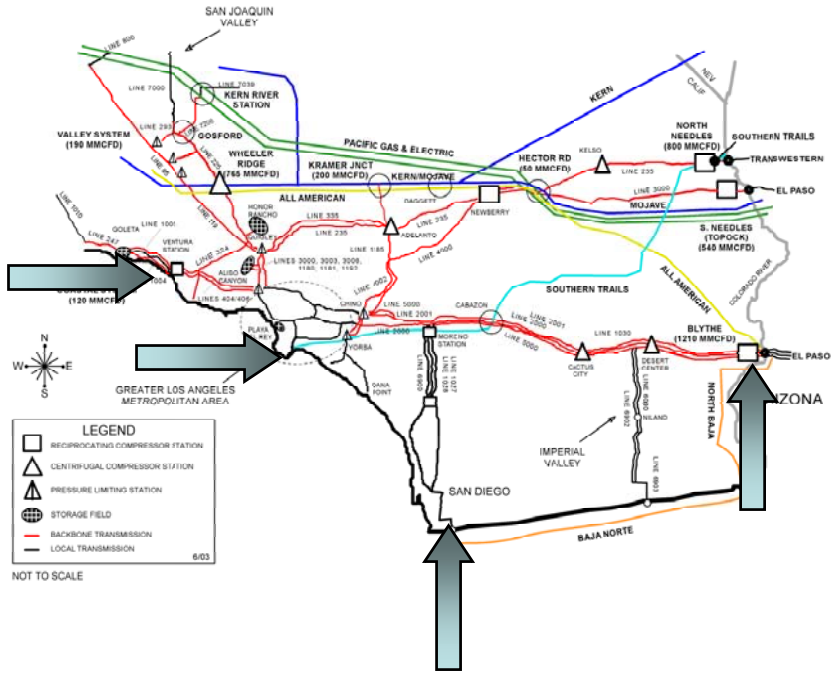
Potential LNG Supplies

Proposed LNG Projects

- Baja Mexico:
  - ChevronTexaco (1.4 Bcf/d)
  - Marathon Oil (0.75 Bcf/d)
  - Sempra / Shell (1.0 Bcf/d)
- Long Beach
  - Mitsubishi (0.7 – 1.0 Bcf/d)
- Offshore Ventura/Oxnard
  - BHP Billiton (0.8 Bcf/d)
  - Crystal Energy (1.0 Bcf/d)

Reference: Gas Daily 1/27/04



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Current Gas Quality Standards

SoCalGas Rule 30

- Heating Value: 970 Btu/cf Min
  1150 Btu/cf Max
- Carbon Dioxide: 3% Max
- Oxygen: 0.2% Max
- Inerts:
  - CO_2, N_2, O_2: 4% Max
- Interchangeability:
  - Meet AGA Bulletin 36 interchangeability indices relative to typical gas in system

CARB NGV Fuel Spec.

- Hydrocarbons:
  - Methane: 88% Min
  - Ethane: 6% Max
  - C3+: 3% Max
  - C6+: 0.2% Max
- Inerts:
  - $CO_2 + N_2$: 1.5% Min
    4.5% Max

Gas Quality

	Current Range of Gas Supplies	Current System Average	Potential LNG Supplies
• Heating Value:	1007 – 1150 Btu/cf	1020 Btu/cf	1063 – 1166 Btu/cf
• Wobbe Index:	1283 – 1431	1332	1373 - 1446
• Carbon Dioxide:	0.9 – 3.0%	1.25%	Trace
• Air (N_2, O_2):	0.1 – 3.2%	0.7%	Trace
• Total Inerts:	0.3 – 4.0%	1.95%	Trace
• Methane:	84 – 99%	95.4%	83.2 – 91.2%
• Ethane:	0.1 – 10%	2.1%	4.3 – 13.2%
• C3+:	0.1 – 7.1%	0.5%	2.2 – 5.0%
• C6+:	Trace – 0.1%	Trace	Trace

Findings

- Southern California safely handles a wide range of gas supplies with a significant variation in gas quality
  - Limited volumes of outlying gas supplies
- Magnitude of potential LNG supplies & system characteristics will limit ability to blend LNG with pipeline gas
  - Swings in gas demand will result in a significant number of customers regularly being switched back and forth between LNG and pipeline gas
- Current Gas Quality Standards require review and may require modification
  - Interchangeability Indices may not apply for new burner technologies
  - Combustion equipment may not be sufficiently robust to handle rapid swings in gas composition
- Current CARB NGV Fuel Specifications will inhibit introduction of most potential LNG supplies

Interchangeability Issues

- Gas Quality Standards need to allow for a broad range of gas supplies consistent with the requirements of end-use equipment
- Pipeline operators have developed standards unique to their supply and end use mix making development of a prescriptive national standard impractical
- National interchangeability guidelines, developed based on scientific facts, would be beneficial to system operators in establishing tariffs for gas quality
- National interchangeability guidelines should address issues such as customer safety (CO emissions), impacts on air quality (NOx emissions) and legacy NGV fleet implications

SoCalGas Action Plan

1. Undertake a limited scope research study to assess appropriateness of current gas quality standards and/or need for modification
   - Currently underway with broad support from potential LNG suppliers, State regulatory agencies & local air quality management districts
2. Complete an NGV Legacy Fleet Study to identify fleet characteristics and options to allow use of higher heat content fuel
   - Fleet characterization complete & options assessment underway
3. Participate in joint industry / government LNG efforts focused on determining if a national natural gas quality standard is appropriate
4. Participate in industry-wide assessment of LNG interchangeability in industrial and commercial burners, turbines and microturbines

Conclusions

- SoCalGas supports a national effort to evaluate gas interchangeability and establish parameters to be considered by system operators in their development of gas quality standards
- Process should include stakeholders along the natural gas value chain as well as the appropriate regulators
- Funding for this effort is appropriately derived from the DOE's Office of Fossil Energy